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UNITED STATES DEPARTMENT OF AGRICULTURE

OKRA: CULTURE AND USE[1]

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The Plant

Okra, or gumbo, is a tropical annual native to Africa. It has long been popular in vegetable gardens of the South, where the young pods are commonly used not only in soups and stews but as a separate dish. Since about 1925 it has appeared increasingly in fresh-vegetable markets farther northward, although it remains a minor crop there. In a few districts it is grown extensively for large commercial canneries.

The okra flower is similar to that of cotton and of the ornamental hibiscus. The plant is generally much-branched, sturdy and woody, and reaches a height of 3 to 6 feet.

This vegetable can be grown anywhere in the United States where other vegetables are grown except in the coolest, northernmost parts or at high altitudes. The plant develops rapidly in areas that are suitable for it, requiring but 2 months from planting to harvest of the first pods, but it will not thrive in cool weather and is tender to frost. Well-grown plants continue to bear for many weeks, especially if the young pods are all harvested promptly and none are allowed to mature.

Varieties

Varieties range from 3 to 6 feet or more in plant height. Currently popular varieties bear pods that are 6 to 8 inches long when mature, and either with or without distinct longitudinal ridges (figs. 1 and 2).

Perkins Spineless is a dwarf variety; plants 3 feet tall; mature pods 7 inches long, free of spines, ridged, green.

Dwarf Long Pod or Dwarf Green Long Pod is of the same type as Perkins Spineless; plants about 3 feet tall; mature pods 7 to 8 inches long, free of spines, ridged, green.

Clemson Spineless is a medium-tall kind; plants about 4½ feet tall; mature pods 6 inches long, free of spines, moderately ridged, green.

Louisiana Green or Green Velvet is medium tall; plants 5 to 6 feet tall; mature pods about 7 inches long, slender, free of spines, slightly ridged, green.

White Velvet or Ladyfinger is tall; plants 5 to 6 feet tall; mature pods 6 to 7 inches long, slender, free of spines, tapered, cylindrical, not ridged, creamy white.

Perkins Mammoth Long Pod is a very tall variety; plants 6 to 7 feet tall; mature pods 7 to 8 inches long, free of spines, ridged, green.

[1] Supersedes Farmers' Bulletin 232, Culture and Uses of Okra.

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FIGURE 1.—Tall, green, ridged type of okra.



FIGURE 2.—Ladyfinger type of okra.

Soils and Soil Fertility

Okra grows well in any good well-drained garden or truck-crop soil, but best in a rich sandy loam. No special preparation or treatment of the soil is required—only moderate deep plowing or spading, and thorough harrowing or raking to form a good seedbed. As for most other vegetable crops, the soil should be well supplied with organic matter from animal manures at 10 to 20 tons per acre per year, from green-manure crops plowed under, or from compost worked into the soil.

Commercial fertilizers in addition to manures or compost are generally needed for best yields and quality of okra. Depending on the past management and the richness of the soil, 800 to 1,200 pounds per acre of a mixture containing about 5 percent nitrogen, 8 to 10 percent phosphoric acid, and 5 percent potash should be applied. The fertilizer may be broadcast and worked into the soil before planting; or up to 500 or 600 pounds may be applied in bands—5 to 6 pounds per 100 feet of row—about 3 inches to each side of the row and a little deeper than the seed is planted, and then an equal amount broadcast.

Under most conditions germination and stand will be improved by treating the seed with a chemical to control certain fungi that cause decay of the seed or destroy the young seedlings before emergence. New Improved Ceresan at ½ level teaspoonful per pound of seed (or 4 ounces per 100 pounds) is effective, as are Spergon or thiram (Arasan) at 1 level teaspoonful per pound or 6 to 8 ounces per 100 pounds of seed.

Planting and Cultivating

Except in the warmer parts of the South, only one planting of okra is made per season. The seed is planted as soon as the soil has warmed up well and all danger of frost is past.

For dwarf varieties, the rows should be approximately 3½ feet apart: for medium-tall varieties, 4 feet: and for tall varieties, 4½ feet. The dwarf plants should be about 1 foot apart in the row: the tall plants, 1½ to 2 feet. Plant, either by hand or with a seed drill, 8 to 10 pounds per acre, 3 to 4 seeds per foot of row, and thin the plants to proper distance apart when they are 3 or 4 inches tall. One ounce of seed is enough for 100 feet of row. In the lower South, later plantings may be made at intervals of about 6 weeks if a continuous supply of pods is desired throughout the long season. Experience in any particular locality will indicate when successive plantings should be made to bring in a new crop when the yield and quality of an earlier planting decline.

Hoeing or cultivating to control weeds should be shallow.

Harvesting

Except in unusually hot weather, an okra pod usually reaches a very good stage for eating in 4 to 6 days after the flower opens. The pods of most popular varieties are only 3 to 3½ inches long at this stage, and are tender and free of fiber. One or two days' delay beyond this stage will yield pods that are tough and of poor quality. The plants must be gone over at least every second day, preferably every day, to harvest pods of the best size and quality. Pods smaller than 3 inches long are very good to eat; but, of course, harvesting at a very small size results in low yields. Large yields must not be sought, however, by allowing the pods to approach their full size because then they are too tough and fibrous for food.

After harvest the pods must be kept reasonably cool and well-ventilated. In large or closely packed containers, okra is likely to be spoiled by heating.

Injurious Insects and Their Control [2]

In general the okra plant is not seriously injured by insects. The corn earworm, or bollworm,[3] bores into the pods and makes them unfit for food, and the southern green stink bug [4] and some other plant bugs pierce the pods and extract the plant juices. As this damage occurs late in the season, however, the loss is usually negligible. Blister beetles,[5] cucumber beetles,[6] flea beetles,[7] and the melon, or cotton, aphid [8] feed on the foliage of okra, but ordinarily this feeding does not affect the production of pods.

When the southern green stink bug or other plant bugs are present in sufficient numbers to warrant the expense, a dust containing 10 or 20 percent of sabadilla is the best remedy. In small gardens, persistent hand picking of these insects usually gives sufficient control.

Blister beetles and corn earworms can be controlled with a dust containing 70 percent of cryolite or a spray consisting of 1½ pounds of

[2] This section prepared by W. H. White, formerly in charge, Division of Truck Crop and Garden Insect Investigations, Bureau of Entomology and Plant Quarantine.

[3] *Heliothis armigera* (Hbn.).

[4] *Nezara viridula* (L.).

[5] *Epicauta* spp.

[6] *Diabrotica* spp. and *Acalymma* spp.

[7] *Epitrix* spp. and *Phyllotreta* spp.

[8] *Aphis gossypii* Glov.

cryolite in 50 gallons of water. In small gardens the blister beetles may be hand-picked and destroyed. As these beetles may blister tender skin, wear gloves when handling them.

Cucumber beetles and flea beetles can be controlled with cube or derris, in either a dust containing from 0.75 to 1 percent of rotenone or a spray containing approximately 0.025 percent of rotenone.

The best remedy for the melon aphid is a nicotine sulfate spray. Use ½ pint of 40-percent nicotine sulfate and 4 pounds of mild laundry soap in 50 gallons of water or, for small gardens, 1 tablespoonful of nicotine sulfate and a 1-inch cube of soap or 2 level tablespoonfuls of soap flakes in 1 gallon of water. A 3-percent nicotine dust is also effective.

The insecticides should be applied to all parts of the plants as soon as the insects are detected.

Caution: Do not apply cryolite on okra when pods are present as it will leave a harmful residue on the treated pods.

Food Value and Use

At good edible stage okra pods contain about 90 percent of water, 2 percent of proteins, 7 percent of carbohydrates, and 1 percent of minerals. Like most other green, fresh vegetables, okra is relatively low in fuel value; it is valuable chiefly for its bulk, minerals, and vitamins. Okra is a good source of calcium and a fair source of iron in the diet. Fresh pods of green varieties are rich in provitamin A; dried okra contains only half or less of the vitamin A present in fresh pods. They are a fair to good source of vitamin B. Young pods 2½ to 3 inches long are relatively high in vitamin C; they are nearly twice as rich in vitamin C as older pods 5½ to 6 inches long. At room temperature vitamin C is lost rapidly after the pods are harvested; nearly half of it disappears in 24 hours. At ordinary refrigerator temperature (50° F.), however, vitamin C loss is slight. The pods therefore should be used promptly after harvest or kept refrigerated.

Okra is used chiefly as only one of several ingredients in soups, stews, and various "creole" dishes. When cooked "straight" its mucilaginous properties do not suit most people. When it is fried, either plain or dipped in corn meal before frying, the mucilage in it is less evident than if it is boiled. See pages 5 to 7 for several methods of cooking okra.

In some lands where other methods of preservation are not available, okra is dried for later use. Either the small entire pods are strung on coarse thread and hung up to dry (figs. 3 and 4) or the sliced pods are dried on cloth trays and stored in bags.

Thousands of tons of okra, grown in the South, are sliced and preserved in brine for use by the large commercial canners of soups and related products. The crops for this purpose are grown under contract with the individual or company that operates the central packing plant where the okra is washed, trimmed, sliced, and barreled in brine.

Use of Okra in Cookery

The tender green okra pods lend themselves to a number of ways of preparation, either alone or in combination with other vegetables, or in soups and stews. Dried okra is especially good in soups, though it



FIGURE 3.—Large pods of okra dried for winter use.

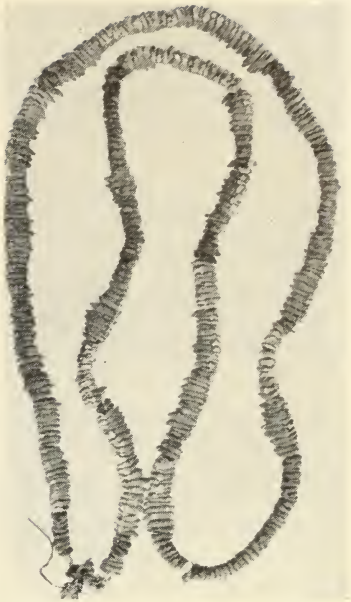


FIGURE 4.—Small pods of okra dried for winter use.

can be used in any recipe calling for fresh okra if it is first freshened in water and then drained and wiped dry. The recipes here call for the use of fresh or dried okra. Copper, brass, or iron cooking utensils should not be used in preparing okra, as the pods become discolored.

CHICKEN GUMBO

1 quart young okra.
1 chicken, 3 to 4 pounds.
1 slice ham, about 1 pound.
4 tablespoons butter or other fat.
1 quart fresh skinned chopped tomatoes or cooked tomatoes.
1 large onion, chopped.
1 sprig parsley.
3 quarts boiling water.
Salt.
A little cayenne.

Wash and stem the okra and cut in ½-inch slices. Dress and cut up the chicken. Fry the okra in 2 tablespoons of the fat in a large kettle until lightly browned. Remove from the kettle. Melt the remaining fat in the kettle, add the chicken and ham, cover closely, and cook for about 10 minutes, turning when necessary. Add the tomatoes, onion, parsley, water, and browned okra. Simmer for an hour or two, or until the chicken and ham are tender. Add salt to taste and a little cayenne. Serve with flaky cooked rice.

OKRA AND BEEF STEW

1 pint okra.
2 pounds lean beef.
Salt.
Pepper.
¼ pound fat.
1 large onion, chopped.
2 quarts cold water.

Wash the okra thoroughly, discard the stems, and chop the okra very fine. Cut the beef into small pieces; season with salt and pepper. Melt the fat in a large kettle, add the meat and onion, and stir until

lightly browned. Add the cold water and simmer until the meat is tender, then add the okra and continue to simmer until the okra is tender. Add more seasoning if necessary. A No. 2 can of okra can be used to replace the fresh okra and a No. 3 can of tomatoes to replace 1 quart of the water.

BOILED OKRA

1 quart young okra.
1 pint water.
¾ teaspoon salt.
Pepper.
1 tablespoon butter.
1 tablespoon tarragon vinegar.

Wash the okra and cut off the stem ends. Cook in boiling salted water until tender, or about 10 minutes. Drain and add the seasoning. Serve hot or cold.

OKRA SALAD

Young okra pods, boiled whole and chilled, may be served on lettuce with French dressing. They may also be used in a combination salad with sliced tomato or grated carrot and cut celery, cooked string beans and onion, or crisped chopped bacon. This salad may be served on lettuce or other salad greens.

BAKED OKRA

Select young okra, wash thoroughly, remove the stems, and wipe the okra dry. Fill a greased baking dish with the okra, sprinkle with salt, and dot with butter or other fat. Cover and bake in a moderate oven (350° F.) until the okra is tender. Serve in the baking dish.

BRAISED OKRA

2 quarts young okra.
4 tablespoons fat.
Salt to taste.

Wash the okra, dry thoroughly, and cut crosswise in pieces about one-half inch thick. Heat the fat in a frying pan, add the okra, cover, and cook 10 minutes. Stir frequently to prevent scorching. Remove the cover, continue to cook until the okra is tender, and brown lightly. Serve at once.

If preferred, the okra may be rolled in seasoned corn meal before being fried. Also the whole pods may be parboiled and drained, then dipped in corn meal, and fried.

OKRA FRITTERS

1 pint young okra.
1 tablespoon butter or other fat.
1 egg.
½ cup milk.
1 cup sifted flour.
½ teaspoon salt.
2 teaspoons baking powder.
Fat for frying.

Wash and stem the okra, dry thoroughly, and cut crosswise into thin slices. Melt the fat in a frying pan and brown the okra slightly, stirring frequently. Combine the beaten egg and milk. Add gradually to the sifted dry ingredients, stirring only until the batter is smooth; then stir in the okra. Drop the batter by spoonfuls into deep fat heated to 365° to 370° F. Remove when light brown on both sides and drain on absorbent paper. Or, the fritters may be fried in shallow fat.

SCALLOPED OKRA AND TOMATOES

1 quart young okra.
4 tablespoons butter or other fat.
1 small onion, chopped.
1 quart fresh skinned chopped tomatoes or cooked tomatoes.
2 teaspoons salt.
Pepper.
1 cup fine, dry bread crumbs.

Select young okra, wash thoroughly, remove the stems, dry the okra, and cut in ½-inch slices. Melt 2 tablespoons of the fat in a frying pan, add the onion and okra, and cook until both are slightly browned, stirring frequently. Add the tomatoes, salt, and pepper, and simmer for about 10 minutes. Pour the mixture into a shallow greased baking dish and cover with the bread crumbs mixed with the remaining melted fat. Bake in a moderate oven (350° F.) for 15 minutes, or until the okra is tender and the crumbs are browned.

BAKED OKRA, RICE, AND TOMATOES

1 quart young okra.
¼ cup rice, washed.
1 quart cooked tomatoes.
1½ teaspoons salt.
Pepper.
Curry (if desired).
Butter.

Wash the okra thoroughly, remove the stem ends, and cut into thin slices. Sprinkle about 1 tablespoon of the rice in a greased baking dish, cover with a layer of the okra and then with a thin layer of the tomatoes, and repeat. Season each layer with salt and pepper and dot with butter. Cover and bake in a very moderate oven (325° F.) until the rice is tender. Remove the cover to allow slight browning.

SCALLOPED OKRA AND CORN

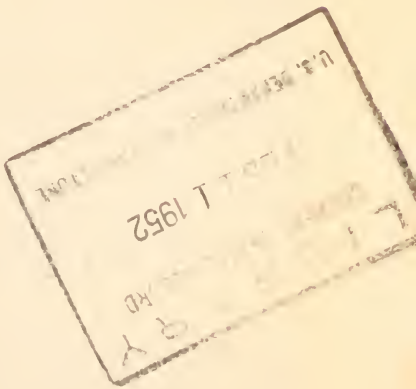
3 cups sliced okra.
4 tablespoons butter or other fat.
2 cups cooked corn.
1 teaspoon salt.
Pepper.
2 tablespoons flour.
1 cup milk.
¼ pound sharp cheese.
1 cup fine, dry bread crumbs.

Fry the okra in 2 tablespoons of the fat for about 10 minutes, stirring frequently to prevent scorching. Place the okra and corn in alternate layers in a greased baking dish. Sprinkle each layer with salt and pepper, reserving one-fourth teaspoon of salt for the sauce. Make a sauce of the 2 remaining tablespoons of fat, the 2 tablespoons of flour, and the milk. Add the cheese and salt, and stir until the cheese has melted. Pour over the okra and corn, and cover with the crumbs. Bake in a moderate oven (350° F.) until the mixture is hot through and the crumbs are brown.

CANNED OKRA AND TOMATOES

Use only young, tender okra and sound, ripe tomatoes. Wash the okra and slice crosswise. Wash the tomatoes, scald, remove the skins and cores, and cut into sections. Combine the okra and tomatoes, and heat to the boiling point. Pack while hot into containers and add 1 level teaspoon of salt to each quart. Partially seal glass jars and process pint jars 25 minutes at 240° F. or 10 pounds' pressure, and

quart jars 40 minutes at the same temperature. Complete the seal immediately after removing the jars from the boiling water. Plain tin cans are used for this product. Seal immediately after filling, and process the No. 2 cans 25 minutes at 240° F. or 10 pounds' pressure. and No. 2½ cans 35 minutes at the same temperature.



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